

Dynamically Scaled Model for NASA's Next Generation Aviation Demonstrator, Phase I

Completed Technology Project (2006 - 2007)



Project Introduction

Significant advances in several key technologies such as material sciences, manufacturing, miniaturization, and active flow control suggest that the time has come to address the issue of affordable General Aviation (GA). These new technologies when combined with advanced avionics and propulsion concepts will make GA affordable and ecologically sustainable. With a greater ease of vehicle operation, GA can become available to a much larger clientele and provide strong impulses for the aerospace industry. When a large number of new technologies are combined in a revolutionary way, validation of the entire system at the design and development stage becomes highly desirable. We propose building and flight testing a dynamically scaled model of NASA's GA demonstrator that will feature many important elements of the new GA concept.

Anticipated Benefits

In addition to the research goals of the dynamically scaled NGAD, ACR will be able to directly benefit from the design and initial development of a light UAV airframe. Just like the goals of the full scale NGAD, the dynamically scaled model will have significant advantages over current light UAV designs. Noise reduction and safety are two of the biggest advantages. In a military context, most UAVs of this class are extremely loud, and can be heard long before being detected by other means. The shrouded fan and enclosed engine of the NGAD will both reduce and shift the noise signature of the aircraft. In civilian UAV applications, noise reduction shares the same value as it does in regards to tail-fan aircraft. Another advantage of the shrouded fan design is safety. By enclosing the propeller, the greatest danger to the ground crew of a UAV is removed.



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Table of Contents

Project Introduction	1
Anticipated Benefits	1
Organizational Responsibility	1
Primary U.S. Work Locations and Key Partners	2
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

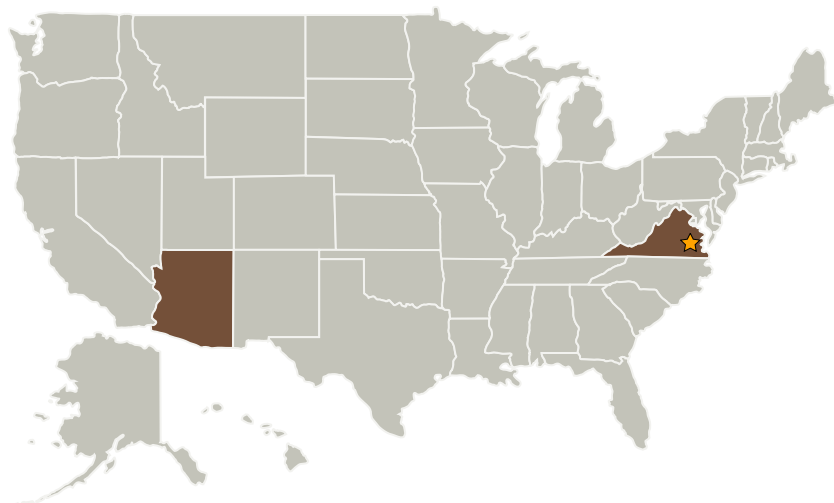
Small Business Innovation
Research/Small Business Tech
Transfer

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Langley Research Center (LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Advanced Ceramics Research, Inc.	Supporting Organization	Industry	Tucson, Arizona
University of Arizona	Supporting Organization	Academia	Tucson, Arizona

Primary U.S. Work Locations

Arizona	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Andrew S Hahn

Principal Investigator:

Anthony Mulligan

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - TX15.1 Aerosciences
 - TX15.1.4 Aeroacoustics